

13. The isolated polynucleotide of claim 12, which is from a luminescent organism.

14. The isolated polynucleotide of Claim 13, wherein the luminescent organism is of the genus Coleoptera.

15. The isolated polynucleotide of Claim 13, wherein the luminescent organism is a firefly.

16. The isolated polynucleotide of claim 13, where the luminescent organism is a North American firefly.

17. The isolated polynucleotide of claim 13, wherein the luminescent organism is an American firefly.

18. An isolated polynucleotide encoding a protein comprising an amino acid sequence of SEQ ID NO:2 or a protein having a deletion, mutation, substitution, or addition of one or more amino acids, and which can regenerate luciferin.

19. An isolated polynucleotide which is at least 50% homologous to the amino acid sequence of SEQ ID NO:2 and which encodes a protein that can regenerate luciferin.

20. A vector comprising the isolated polynucleotide of Claim 12.

21. A vector comprising the isolated polynucleotide of Claim 18.

22. A vector comprising the isolated polynucleotide of Claim 19.

23. A host cell comprising the isolated polynucleotide of Claim 12.

24. A host cell comprising the isolated polynucleotide of Claim 18.

25. A host cell comprising the isolated polynucleotide of Claim 19.

26. A method of producing a protein that can regenerate luciferin, comprising culturing the host cell of claim 23 in a medium, and collecting the protein

27. A method of producing a protein that can regenerate luciferin, comprising

culturing the host cell of claim 24 in a medium, and collecting the protein.

28. A method of producing a protein that can regenerate luciferin, comprising culturing the host cell of claim 25 in a medium, and collecting the protein.

29. *Escherichia coli* FERM BP6908.